



**STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF UNDERGROUND STORAGE TANKS**

TECHNICAL GUIDANCE DOCUMENT - 014

EFFECTIVE DATE: JANUARY 19, 1994

REVISED DATE: AUGUST 1, 1996

REVISED DATE: SEPTEMBER 15, 2003

RE: UST SITE RANKING SYSTEM

I. GENERAL GUIDANCE

A. Purpose

The purpose of this Technical Guidance Document (TGD) is to determine a numerical ranking for underground storage tank sites in accordance with Rule 1200-1-15-.06(5)(b). Numerical ranking is a risk-based evaluation process that identifies existing exposure pathways that may impact human health or further impact environmental conditions. This TGD provides guidance to determine if current site conditions pose a significant threat.

Unless directed to do otherwise by the Division of Underground Storage Tanks (Division), the owner and/or operator shall follow the requirements of Rule 1200-1-15-.06(5)(b) and this guidance document to determine if the site may enter the Monitoring Only Program (MOP) or Completed Corrective Action Monitoring (CCAM). If any condition occurs during the MOP or the CCAM which constitutes a 'significant threat' as defined in this TGD, then the owner and/or operator shall, in response to direction provided by the Division, initiate investigations and/or corrective action pursuant to the requirements of Rule 1200-1-15-.06(6) and (7). However, if the conditions posing a significant threat have been eliminated and adequate justification, with supporting documentation, has been provided to the Division to demonstrate the conditions should not recur, then the site shall be ranked in accordance with this TGD. If free product is present prior to completing the ranking evaluation, then the Division may suspend the ranking evaluation and/or the MOP or CCAM until it is determined that the free product is not practicable to recover in accordance with TGD-004.

B. Applicability

This revision supercedes all previous versions and policies addressing TGD-014 UST Site Ranking System.

II. DEFINITIONS

For the purposes of this TGD, the following definitions apply:

1. **Action Number:** The regulatory limit established by this ranking system. The Action Number is currently 500.
2. **Completed Corrective Action Monitoring:** A monitoring program that may be pursued at the direction of the Division after a minimum of two (2) years of corrective action of soil and/or ground water contamination by an active remediation system. It involves monitoring in accordance with TGD-007 and a schedule established by the Division. It may also include annual reranking of a site that has scored at or below the Action Number.
3. **Monitoring Only Program (MOP):** An approved corrective action program that remediates the site by natural attenuation. It involves semi-annual monitoring in accordance with TGD-007 and annual re-ranking of a site that has scored at or below the Action Number.
4. **Natural Attenuation:** The reduction in concentrations of Benzene and/or Total Petroleum Hydrocarbons (TPH) in the environment with distance and time due to processes such as diffusion, dispersion, absorption, chemical degradation, biodegradation, etc.
5. **Significant Increase:** A substantial variation from previous concentrations in soil and/or ground water that are determined by the Division to be significant and could potentially exceed risk-based levels. Based on this evaluation, the site may be allowed to remain in the MOP or CCAM.
6. **Significant Threat:** For the purpose of this TGD, the definition of significant threat includes but is not limited to:
 - (a) Vapor or explosion hazards are present. Vapors and/or explosion hazards are defined, for the purpose of this evaluation, as the presence of any detectable levels of petroleum vapors in a confined or enclosed space. The site may be ranked or allowed to remain in the MOP or CCAM if the vapor or explosion hazard has been adequately abated;
 - (b)
 - (1) Free product in multiple wells with a thickness greater than 0.01 feet during the last monitoring event; **or**
 - (2) Free product in one well within the last two consecutive monitoring events with a thickness greater than 0.1 feet.

A site with a continuous occurrence of free product that has been recovered to the maximum extent practicable as determined by the Division and is not migrating, may be ranked or allowed to remain in the MOP or CCAM. If free product has not previously been encountered but is detected at greater than 0.01 feet, then this shall be reported to the Division within 72 hours and shall be subject to the requirements of TGD-004;
 - (c) The impacted ground water source is classified as a “drinking water supply”. The site may enter the MOP or CCAM if all conditions that caused the site to be classified as a “drinking water supply” are removed. Sites that can subsequently be re-classified as “non-drinking water” may be ranked;
 - (d) Any surface water on or near the petroleum site is visibly impacted by petroleum product including but not limited to free product/sheen on water, free product/sheen on stream bank/sediment, release of product droplets from

sediment when disturbed or iron staining attributable to petroleum. The site may be ranked or allowed to remain in the MOP or CCAM if the surface water impact has been adequately abated and visual, analytical and/or biological impact is minimal as determined by the Division;

- (e) The numeric ranking, as determined in box 14 of the UST Site Ranking Evaluation, for the site is above the action number. The site may enter or re-enter the MOP or CCAM if site conditions change that result in a score on a subsequent UST Site Ranking Evaluation which is below the action number;
- (f) “Significant increase” in soil and/or ground water analytical results; and/or
- (g) Other public health or environmental problems arise.

III. EVALUATION PROCESS RESULTS

A. Data Evaluation

All site data for the investigation and the results for each category shall be compiled in the format provided within this TGD. Each result is assigned a numerical value. All categories are subsequently totaled to determine a total site score that provides an indication of the level of threat presented by the site. The data and information compiled during the investigation shall be submitted with the UST Site Ranking Evaluation for Division approval. If the initial total site score is above the Action Number, then the owner and/or operator shall, at the direction of the Division, initiate investigations for soil and/or ground water cleanup pursuant to Rule 1200-1-15-.06(6) and (7).

B. Monitoring Only Program or Completed Corrective Action Monitoring

If the initial total site score is at or below the Action Number, then the site may enter the MOP or CCAM with Division approval and shall begin monitoring in accordance with TGD-007. The Division will establish a schedule to submit Site Status Monitoring Reports prepared in accordance with TGD-007. **A properly completed UST Site Ranking Evaluation shall be completed annually using the most recent data (Initial Site Characterization Report or last monitoring event) and submitted in accordance with a schedule established by the Division.**

C. Removal from or Suspension of the Monitoring Only Program or Completed Corrective Action Monitoring

If any subsequent total site score exceeds the Action Number or a significant threat is discovered that cannot be abated or removed, then at the direction of the Division, the site may be removed from the MOP or CCAM and investigations for soil and/or ground water cleanup pursuant to Rule 1200-1-15-.06(6) and (7) shall be initiated. If a significant threat can be abated or removed, then the Division may choose to suspend the MOP or CCAM until the threat has been eliminated.

IV. INSTRUCTIONS FOR COMPLETING THE UST SITE RANKING EVALUATION

After conducting all work necessary to prepare the Initial Site Characterization Report or as directed by the Division, complete the attached UST Site Ranking Evaluation using all site data generated. If site-specific conditions exist which may invalidate a category, then justification may be provided to eliminate the score. The following instructions provide guidance to adequately evaluate categories in the UST Site Ranking Evaluation.

A. Geologic and Hydrogeologic Factors

For categories 1 through 4, the following apply:

1. Minimum depth to water table

The minimum distance in feet between the ground surface and the potentiometric surface (if free product is present, use the adjusted potentiometric surface) shall be determined from all wells installed for this investigation. When confined aquifers are encountered and there is more than 5 feet of head pressure difference between initial and stabilized water elevations, the depth at which water is first encountered shall be used to determine the score.

2. Minimum distance between the water table and contaminated soil

The minimum distance between unsaturated soil with concentrations above the applicable cleanup levels and the water table shall be determined. The minimum distance shall be used to determine the score in this category. When confined aquifers are encountered and there is more than 5 feet of head pressure difference between initial and stabilized water elevations, the depth at which water is first encountered shall be used to determine this score.

3. Soil permeability

The soil permeability shall be determined as described in the Environmental Assessment Guidelines. The maximum permeability shall be used to determine the score in this category. If the soil permeability has not been determined, then the highest score shall be used.

4. Calculated ground water flow rate

The ground water flow rate shall be calculated and the maximum value shall be used to determine the score for this category. If karst conditions exist in the area of the site, then the highest score shall be used. If site-specific conditions exist which may indicate that karst conditions are not affecting the site ground water flow, then justification may be provided to reduce the score.

B. Pathway/Receptor Factors

For categories 5 through 8, the following apply:

All sampling locations where analytical results document contamination above the applicable cleanup level shall be identified as known contamination. These sampling locations include soil borings/monitoring wells, soil or water from tank pits, soil or water from line trenches, or any other related excavation, etc.

To determine the score for each of these categories, evaluate if any of the pathways/receptors (i.e. basement, sanitary sewer, etc.) are within a 50- foot radius of known contamination. If a pathway/receptor exists within this area, then the highest score shall be used. If a pathway/receptor does not exist within 50 feet of the known contamination, then the investigation shall continue in each additional area (50 to 100 foot radius, etc.) until a receptor is identified or it has been determined that a receptor does not exist within 300 feet of known contamination.

If free product less than 0.1 feet is present in one well or less than 0.01 feet in multiple wells (not defined as a significant threat), then also complete part B of categories 5 through 8 of the UST Site Ranking Evaluation. The higher score between part A and B of 5 through 8 shall be used as the score for each of these categories.

For category 9, the following applies:

To establish the score for this category, determine if a surface water body is within a 0.1 mile radius of known contamination. If a surface water body is within this area, then the highest score shall apply and no additional investigation is warranted to determine the score for this category. If a surface water body does not exist within 0.1 mile of known contamination, then the investigation shall continue in each additional area (0.1 to 0.25 mile radius, etc.) until a surface water body is identified or it has been determined that a surface water body does not exist within 0.5 mile of known contamination. If geologic and/or hydrogeologic factors exist that would demonstrate that a surface water body would not be impacted, then a score of zero may be applied to the applicable category, subject to Division approval.

C. Contamination Factors

Table 1 - Contaminant Concentration Factor

1. Determine the maximum dissolved concentrations from all sampling points for the following parameters:
 - (a) Benzene and TPH in ground water. Sampling shall be conducted in accordance with the Environmental Assessment Guidelines. If free product is present in multiple wells with a thickness less than 0.01 feet or in one well less than 0.1 feet, then a minimum of three well volumes shall be purged from the well prior to collecting a sample. A sample shall be collected as soon as a sufficient volume of ground water recharges into the well. If free product is still present after purging, then contact your local Environmental Assistance Center for further guidance. Ground water analytical results used to complete the UST Site Ranking Evaluation shall be from the most recent data (Initial Site Characterization Report or last monitoring event) collected within one year of the date the evaluation is performed. If no data has been collected within one year, then the Division case manager shall be contacted to determine if additional sampling is needed.
 - (b) Benzene and TPH in soil. Sampling shall be conducted in accordance with the Environmental Assessment Guidelines. Soil analytical results used to complete the UST Site Ranking Evaluation shall be from the most recent data (Initial Site Characterization Report or last monitoring event) collected within two years of the date the evaluation is performed. If no data has been collected within two years, then the Division case manager shall be contacted to determine if additional sampling is needed.
2. Determine the applicable cleanup levels as reported in the Initial Site Characterization Report.

3. Divide the maximum concentrations (A) by the applicable cleanup levels (B) to obtain the Contaminant Concentration Factor (C).

For Categories 10 through 13, the following apply:

Use the Contaminant Concentration Factor as computed in Table 1 - Contaminant Concentration Factor to determine the score in each category. All numbers shall be rounded up to the next whole number.

For category 14, the following applies:

Sum the scores for Categories 1 through 13 to determine the Total Site Score.

Signature Page

A signature page, as shown below shall be attached to the Site Ranking Form ONLY IF it is not submitted with any other report. The page shall be signed by the owner/operator (or authorized representative within the organization) and a professional geologist appropriately registered under the Tennessee Geologist Act (T.C.A. §62-36-101 et seq.), or an appropriately licensed engineer under the Tennessee Architects, Engineers, Landscape Architects and Interior Designers Law and Rules (T.C.A. §62-2-101 et seq.).

We, the undersigned, certify under penalty of law, including but not limited to penalties for perjury, that the information contained in this report form and on any attachments, is true, accurate and complete to the best of our knowledge, information, and belief. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for intentional violations.

Owner/Operator (Print name)

Signature

Date

Title (Print)

P.E. or P.G. (Print name)

Signature

Date

Tennessee Registration #

Note: Each of the above signatures shall be notarized separately with the following statement.

STATE OF _____ COUNTY OF _____

Sworn to and subscribed before me by _____ on this date

_____. My commission expires _____.

Notary Public (Print name)

Signature

Date

Stamp/Seal

UST SITE RANKING EVALUATION

Facility ID Number: ____ - ____

Facility Name: _____

Facility Address: _____

Date ranking completed: _____

Significant Threat Evaluation

Determine if any of the following conditions are present: (Refer to Section II of TGD-014 for definitions of a significant threat)	Present	Not Present
Vapor or Explosion Hazards		
Free Product in Multiple Wells greater than 0.01 feet		
Free Product in one well greater than 0.1 feet		
Impacted ground water is classified as "drinking water"		
Any nearby surface water that is visibly impacted		
"Significant increase" in soil and/or ground water analytical results		

If any of the above conditions are present, do not complete the remaining evaluation and contact the Division within 72 hours.

Geologic and Hydrogeologic Factors

1	Minimum depth to the water table (if free product is present, use the adjusted potentiometric surface measurement)	
	<5.0 Feet	50
	5.1 to 10.0 Feet	45
	10.1 to 15.0 Feet	40
	15.1 to 30.0 Feet	35
	30.1 to 50.0 Feet	25
	50.1 to 75.0 Feet	15
	75.1 to 100.0 Feet	10
	>100.0 Feet	5
	Document, date, and page number where information can be verified:	Score
2	Minimum distance between water table and contaminated soil	
	<5.0 Feet	50
	5.1 to 10.0 Feet	45
	10.1 to 15.0 Feet	40
	15.1 to 30.0 Feet	35
	30.1 to 50.0 Feet	25
	50.1 to 75.0 Feet	15
	75.1 to 100.0 Feet	10
	>100.0 Feet	5
	No soil contamination above applicable cleanup levels	0
	Document, date, and page number where information can be verified:	Score

3	Soil permeability	
	Undetermined	30
	$>1.0 \times 10^{-4}$ cm/sec	30
	1.0×10^{-4} to 1.0×10^{-6} cm/sec	20
	$<1.0 \times 10^{-6}$ cm/sec	10
	Document, date, and page number where information can be verified:	Score

4	Calculated ground water flow rate	
	<10 feet/day	3
	10 to 40 feet/day	6
	40.1 to 90 feet/day	12
	90.1 to 130 feet/day	18
	130.1 to 260 feet/day	24
	>260 feet/day	30
	Karst	30
	Document, date, and page number where information can be verified:	Score

Pathway/Receptor Factors

5A	Basements/Crawl Spaces/Utility Vaults	
	<50 feet from known contamination	100
	50 to 100 feet from known contamination	50
	100.1 to 200 feet from known contamination	25
	200.1 to 300 feet from known contamination	10
	>300 feet from known contamination	0
	Document, date, and page number where information can be verified:	Score

5B	Basements/Crawl Spaces/Utility Vaults	
	<50 feet from free product	150
	50 to 100 feet from free product	75
	100.1 to 200 feet from free product	50
	200.1 to 300 feet from free product	25
	>300 feet from free product	0
	Document, date, and page number where information can be verified:	Score

Enter the higher score of 5A or 5B	Score
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6A	Sanitary sewer mains and sanitary service lines	
	<50 feet from known contamination	50
	50 to 100 feet from known contamination	30
	100.1 to 200 feet from known contamination	20
	200.1 to 300 feet from known contamination	10
	>300 feet from known contamination	0
	Document, date, and page number where information can be verified:	Score

6B	Sanitary sewer mains and sanitary service lines	
	<50 feet from free product	75
	50 to 100 feet from free product	40
	100.1 to 200 feet from free product	20
	200.1 to 300 feet from free product	10
	>300 feet from free product	0
	Document, date, and page number where information can be verified:	Score

Enter the higher score of 6A or 6B	Score
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7A	Storm water sewers	
	<50 feet from known contamination	40
	50 to 100 feet from known contamination	20
	100.1 to 200 feet from known contamination	10
	200.1 to 300 feet from known contamination	5
	>300 feet from known contamination	0
	Document, date and page number where information can be verified:	Score

7B	Storm water sewers	
	<50 feet from free product	50
	50 to 100 feet from free product	30
	100.1 to 200 feet from free product	10
	200.1 to 300 feet from free product	5
	>300 feet from free product	0
	Document, date and page number where information can be verified:	Score

Enter the higher score of 7A or 7B	Score	
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8A	Other subsurface utilities (i.e. natural gas, water, electric, telephone, etc.)	
	<50 feet from known contamination	50
	50 to 100 feet from known contamination	30
	100.1 to 200 feet from known contamination	20
	200.1 to 300 feet from known contamination	10
	>300 feet from known contamination	0
	Document, date, and page number where information can be verified:	Score

8B	Other subsurface utilities (i.e. natural gas, water, electric, telephone, etc.)	
	<50 feet from free product	75
	50 to 100 feet from free product	40
	100.1 to 200 feet from free product	20
	200.1 to 300 feet from free product	10
	>300 feet from free product	0
	Document, date, and page number where information can be verified:	Score

Enter the higher score of 8A or 8B	Score	
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9	Distance to surface water	
	<0.1 mile	25
	0.1 to 0.25 mile	15
	0.26 to 0.5 mile	10
	>0.5 mile	0
	Document, date, and page number where information can be verified:	Score

Contaminant Factors

Table 1 - Contaminant Concentration Factor

Contaminant Concentrations	A. Maximum Contaminant Levels (PPM)	B. Applicable Cleanup Levels (PPM)	C. Contaminant Concentration Factor (C=A/B)
Benzene in ground water		0.070	
TPH in ground water		1.0	
Benzene in soil			
TPH in soil			

Document, date, and page numbers where information can be verified:

10	Benzene factor in ground water		
	<1		0
	1 to 10		25
	11 to 50		50
	51 to 100		100
	101 to 500		200
	>500		300
	Score		
11	TPH factor in ground water		
	<1		0
	1 to 10		10
	11 to 50		20
	51 to 100		40
	101 to 500		80
	>500		160
	Score		
12	Benzene factor in soil		
	<1		0
	1 to 5		25
	6 to 10		50
	11 to 50		100
	>50		200
	Score		
13	TPH factor in soil		
	<1		0
	1 to 5		10
	6 to 10		20
	11 to 50		40
	>50		80
	Score		
14	Total site score		